

What is claimed:

1. An isolated nucleic acid molecule which encodes a CRSP protein,
5 comprising a nucleotide sequence at least about 80% homologous to a nucleotide
sequence of SEQ ID NO:4, SEQ ID NO:6, or a complement thereof.
2. The isolated nucleic acid molecule of claim 1 comprising the nucleotide
10 sequence of SEQ ID NO:6, or a complement thereof.
3. The isolated nucleic acid molecule of claim 2, further comprising
nucleotides 1-125 of SEQ ID NO:4.
4. The isolated nucleic acid molecule of claim 2, further comprising
15 nucleotides 797-848 of SEQ ID NO:4.
5. The isolated nucleic acid molecule of claim 1 comprising the nucleotide
sequence of SEQ ID NO:4 or a complement thereof.
- 20 6. An isolated nucleic acid molecule comprising a nucleotide sequence
encoding a protein which comprises an amino acid sequence at least about 60%
homologous to the amino acid sequence of SEQ ID NO:5.
7. The isolated nucleic acid molecule of claim 6 comprising a nucleotide
25 sequence encoding a protein which comprises the amino acid sequence of SEQ ID
NO:5.
8. An isolated nucleic acid molecule encoding a CRSP protein comprising a
nucleotide sequence which hybridizes under stringent hybridization conditions to a
30 nucleic acid molecule comprising the nucleotide sequence of SEQ ID NO:4 or SEQ ID
NO:6.
9. An isolated nucleic acid molecule comprising a nucleotide sequence
which hybridizes under stringent hybridization conditions to a nucleic acid molecule
35 comprising nucleotides 1-475 of SEQ ID NO:4.

10. An isolated nucleic acid molecule at least 500 nucleotides in length which hybridizes under stringent hybridization conditions to a nucleic acid molecule comprising the nucleotide sequence of SEQ ID NO:4 or SEQ ID NO:6.
- 5 11. The isolated nucleic acid molecule of claim 1, 6, 8, 9, or 10, which specifically detects a CRSP nucleic acid molecule relative to a nucleic acid molecule encoding a non-CRSP protein.
- 10 12. An isolated nucleic acid molecule which is antisense to the nucleic acid molecule of any of claims 1, 6, 8, 9, or 10.
13. A vector comprising the nucleic acid molecule of any of claims 1, 6, 8, 9, or 10.
- 15 14. The vector of claim 13, which is a recombinant expression vector.
15. A host cell containing the vector of claim 14.
- 20 16. A method for producing CRSP protein comprising culturing the host cell of claim 15 in a suitable medium until CRSP protein is produced.
17. The method of claim 16, further comprising isolating CRSP protein from the medium or the host cell.
- 25 18. A nonhuman transgenic animal which contains cells carrying a transgene encoding CRSP protein.
19. A nonhuman homologous recombinant animal which contains cells having an altered CRSP gene.
- 30 20. An isolated CRSP protein comprising an amino acid sequence at least about 60% homologous to the amino acid sequence of SEQ ID NO:5.
- 35 21. An isolated CRSP protein which is encoded by a nucleic acid molecule comprising a nucleotide sequence at least about 80% homologous to a nucleotide sequence of SEQ ID NO:6, or a complement thereof.

22. An isolated CRSP protein which is encoded by a nucleic acid molecule comprising a nucleotide sequence at least about 80% homologous to a nucleotide sequence of SEQ ID NO:4, or a complement thereof.
- 5 23. ✓ An isolated CRSP protein which is encoded by a nucleic acid molecule comprising a nucleotide sequence which hybridizes under stringent hybridization conditions to a nucleic acid molecule comprising the nucleotide sequence of SEQ ID NO:6.
- 10 24. ✓ An isolated CRSP protein which is encoded by a nucleic acid molecule comprising a nucleotide sequence which hybridizes under stringent hybridization conditions to a nucleic acid molecule comprising the nucleotide sequence of SEQ ID NO:4.
- 15 25. An isolated protein comprising an amino acid sequence sufficiently homologous to the amino acid sequence of SEQ ID NO:5, wherein the protein retains a CRSP biological activity.
- 20 26. The isolated protein of claim 25, comprising an amino acid sequence 60% homologous to an amino acid sequence of SEQ ID NO:5.
27. The isolated protein of any of claims 20-25, comprising at least one cysteine-rich domain.
- 25 28. The isolated protein of any of claims 20-25, comprising at least one cysteine-rich region.
29. ✓ An isolated protein comprising the amino acid sequence of SEQ ID NO:5.
- 30 30. ✓ A fusion protein comprising an CRSP-2 polypeptide operatively linked to a non-CRSP polypeptide.
31. The fusion protein of claim 30, wherein the CRSP-2 polypeptide
- 35 comprises a cysteine-rich domain.
32. An antibody that specifically binds CRSP-2.

33. The antibody of claim 32, which is monoclonal.
34. The antibody of claim 33, which is labeled with a detectable substance.
- 5 35. A pharmaceutical composition comprising the protein of any one of claims 20-25, 29, or 30, and a pharmaceutically acceptable carrier.
36. A pharmaceutical composition comprising the antibody of claim 32 and a pharmaceutically acceptable carrier.
- 10 37. ✓ A method for modulating a cell-associated activity comprising contacting a cell with an agent which modulates CRSP-2 protein activity or CRSP-2 nucleic acid expression such that the cell-associated activity is altered relative to the cell-associated activity of the cell in the absence of the agent.
- 15 38. The method of claim 37, wherein the agent stimulates a CRSP-2 protein activity or expression.
- 20 39. The method of claim 37, wherein the agent inhibits a CRSP-2 protein activity or expression.
40. The method of claim 39, wherein the agent is an antisense CRSP-2 nucleic acid molecule.
- 25 41. The method of claim 39, wherein the agent is an antibody that specifically binds to CRSP-2.
42. The method of claim 37, wherein the cell is present within a subject and the agent is administered to the subject.
- 30 43. ✓ A method for treating a subject having a disorder characterized by aberrant CRSP-2 protein activity or nucleic acid expression comprising administering to the subject a CRSP-2 modulator such that treatment of the subject occurs.
- 35 44. The method of claim 43, wherein the CRSP-2 modulator is a small molecule.

45. The method of claim 43, wherein the CRSP-2 modulator is a CRSP-2 protein.

46. The method of claim 43, wherein the CRSP-2 modulator is a nucleic acid molecule encoding an CRSP-2 protein.

47. The method of claim 43, wherein the disorder is a developmental disorder.

48. The method of claim 43, wherein the disorder is a proliferative disorder.

49. A method for detecting the presence of CRSP-2 activity in a biological sample comprising contacting a biological sample with an agent capable of detecting an indicator of CRSP-2 activity such that the presence of CRSP-2 activity is detected in the biological sample.

50. The method of claim 49, wherein the agent detects CRSP-2 mRNA.

51. The method of claim 49, wherein the agent is a labeled nucleic acid probe capable of hybridizing to CRSP-2 mRNA.

52. The method of claim 49, wherein the agent detects CRSP-2 protein.

53. The method of claim 49, wherein the agent is a labeled antibody capable of specifically binding to CRSP-2 protein.

54. A kit for detecting the presence of CRSP-2 activity in a biological sample comprising an agent capable of detecting an indicator of CRSP-2 activity in a biological sample.

55. The kit of claim 54, wherein the agent is a nucleic acid probe capable of hybridizing to CRSP-2 mRNA.

56. The kit of claim 54, wherein the agent is an antibody capable of specifically binding to CRSP-2 protein.

57. The kit of claim 54, further comprising instructions for use.

58. A diagnostic assay for identifying a genetic alteration in a cell sample, the presence or absence of the genetic alteration characterized by at least one of (i) aberrant modification or mutation of a gene encoding an CRSP-2 protein, and (ii) mis-regulation of said gene or (iii) aberrant post-translational modification of an CRSP-2 protein.

59. The assay of claim 58, wherein detecting said alteration includes:

- a. providing a reagent comprising a diagnostic probe of claim 9 or 10;
- b. combining said reagent with nucleic acid of said cell sample; and
- c. detecting, by hybridization of said probe to said cellular nucleic acid, the existence of at least one of a deletion of one or more nucleotides from said gene, an addition of one or more nucleotides to said gene, a substitution of one or more nucleotides of said gene, a gross chromosomal rearrangement of all or a portion of said gene, a gross alteration in the level of an mRNA transcript of said gene, or a non-wild type splicing pattern of an mRNA transcript of said gene.

60. The assay of claim 58, wherein detecting said alteration includes:

- a. providing a reagent comprising two diagnostic probes;
- b. combining said reagent with nucleic acid of said cell sample; and
- c. detecting, by amplification or lack of amplification of said cellular nucleic acid, the absence or existence of said alteration.

61. A method for identifying a compound that modulates the activity of a CRSP protein, comprising:

- a. providing a indicator composition comprising a protein having CRSP-2 activity;
- b. contacting the indicator composition with a test compound; and
- c. determining the effect of the test compound on CRSP-2 activity in the indicator composition to thereby identify a compound that modulates the activity of an CRSP-2 protein.

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